

PRELIMINARY DATA SUMMARY

March 1988

U.S. Army Engineer Waterways Experiment Station
Coastal Engineering Research Center
Field Research Facility
Duck, North Carolina

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CERC Field Research Facility
Duck, North Carolina

This report provides a summary of basic oceanographic, meteorological and bottom profile data for the month. The data were obtained as part of the Field Research Facility Measurement and Analysis Work Unit at the U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's Field Research Facility (FRF) in Duck, North Carolina. The FRF staff collected and analyzed these data. These summaries are intended to make the data readily available to all FRF users, and comments on their content and usefulness are invited.

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PART I: INTRODUCTION

The U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's (CERC's) Field Research Facility (FRF) is located on the Outer Banks of North Carolina, near the village of Duck (Figure 1).

The FRF research program provides a means for obtaining high-quality field data, particularly during storms, in support of the U.S. Army Corps of Engineers' coastal engineering research missions. The research pier is a reinforced concrete structure supported on 0.9-m-diam steel piles spaced 12.2 m apart along the pier's length and 4.6 m apart across the width. The pier deck is 6.1 m wide and extends from behind the duneline to about the 6-m water depth contour at a height 7.6 m above the National Geodetic Vertical Datum (NGVD). In addition, a main building contains offices, an instrument repair shop, and a data acquisition room.

One of the responsibilities of the FRF research program is the collection, analysis and dissemination of data on local oceanographic and meteorological conditions. Bottom profiles along both sides of the pier and periodic bathymetric surveys are also performed.

This summary is intended to provide basic data as soon as possible after they are obtained. Questions and/or comments concerning the data may be directed to Mr. Herman C. Miller at (919) 261-3511.

Part II presents the meteorological data; Parts III through VI present oceanographic data; Part VII presents nearshore profiles and bathymetry; and Part VIII, if included, documents special events that occurred at the FRF during the month.

Table 1 is a list of instruments used, their operational status during the month, and the data collection status. Figure 2 identifies the location of the instruments. The water depths at the wave gages and current meters vary and may be determined from information contained in Figure 7. Other installation information is contained in Table 1.

Times given in the report, unless otherwise specified, are referenced to eastern standard time (EST).

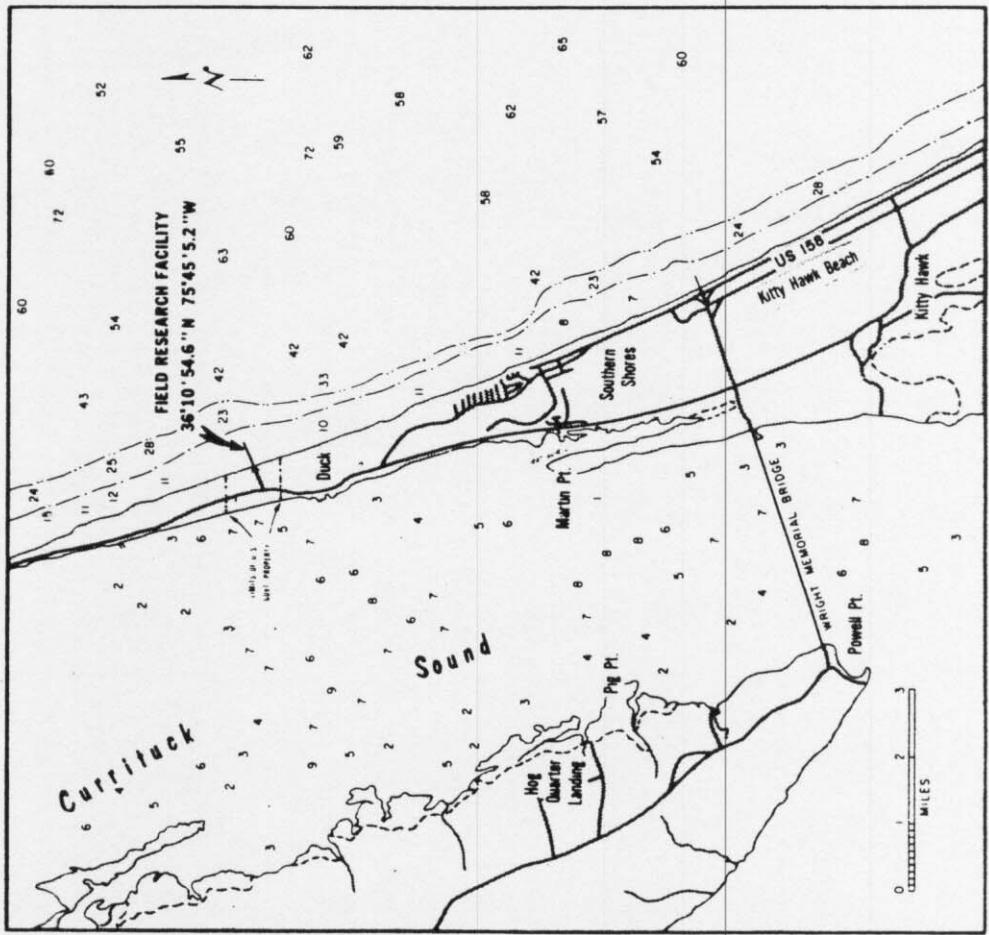
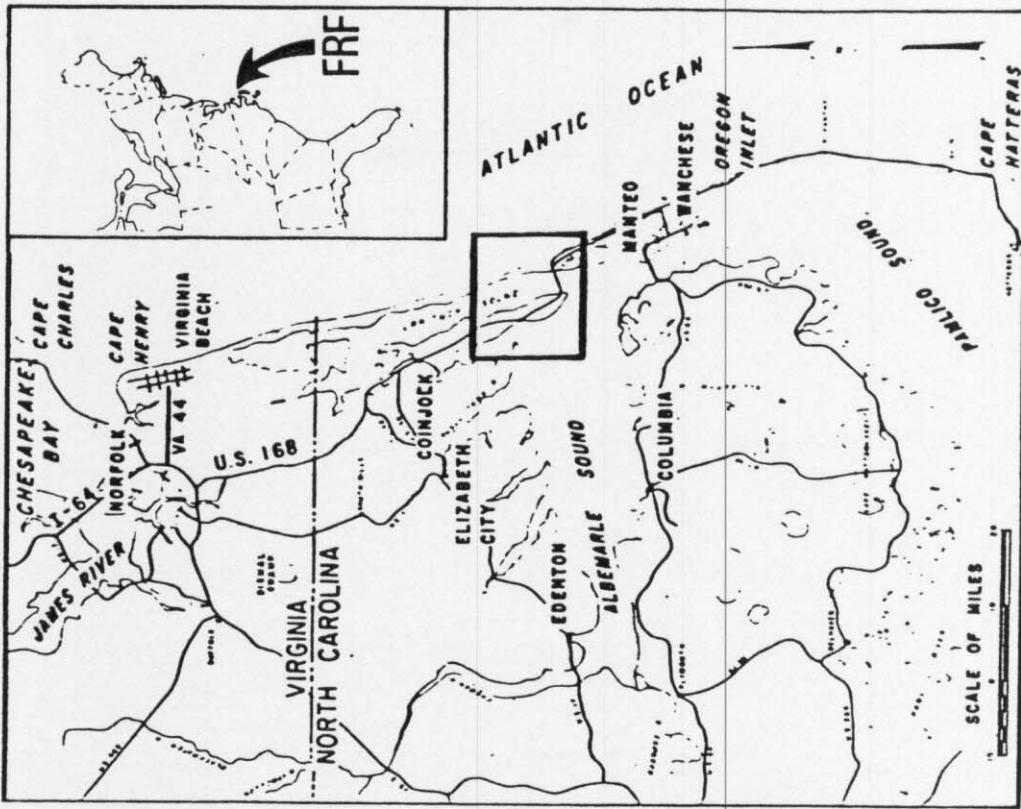


Figure 1. FRF location map

Table 1: Instrument Status/Data Availability

Gage ID	Description/Remarks	Depth at Sensor		Day of the month																																
				1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1		
616	Barometric Pressure		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	/	*	*	*	*	*	*	*	*	*	*	*	*		
			Analog Record	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
604	Precipitation		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
624	Air Temperature		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
632	Anemometer on Laboratory Building Elevation 19 m (NGVD)		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
			Analog Record	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
645	Baylor staff at station 7+80 on FRF pier	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
625	Baylor staff at station 19+00 on FRF pier	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
111	Pressure gage 309 m north of FRF pier (0.9 km offshore)	Approx. 7.8 m NGVD	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*	
630	Waverider buoy 6.0 km offshore	Approx. 23 m NGVD	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
679	Current meter 500 m south of FRF pier (0.5 km offshore)	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	/	*	*	*	*	*	*	*	*	*	*	*	*	*		
865-1370	NOAA tide station at seaward end of FRF pier		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
	Supplemental Observations (daily oceanographic and meteorological observations)		Daily observation	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Gage Status Daily Observation Analog Record Data Collected
 Operational = * Complete = * Complete = * All = *
 Partial = / Partial = / Partial = / Partial = /
 Non-Operational = - None = - None = - None = -

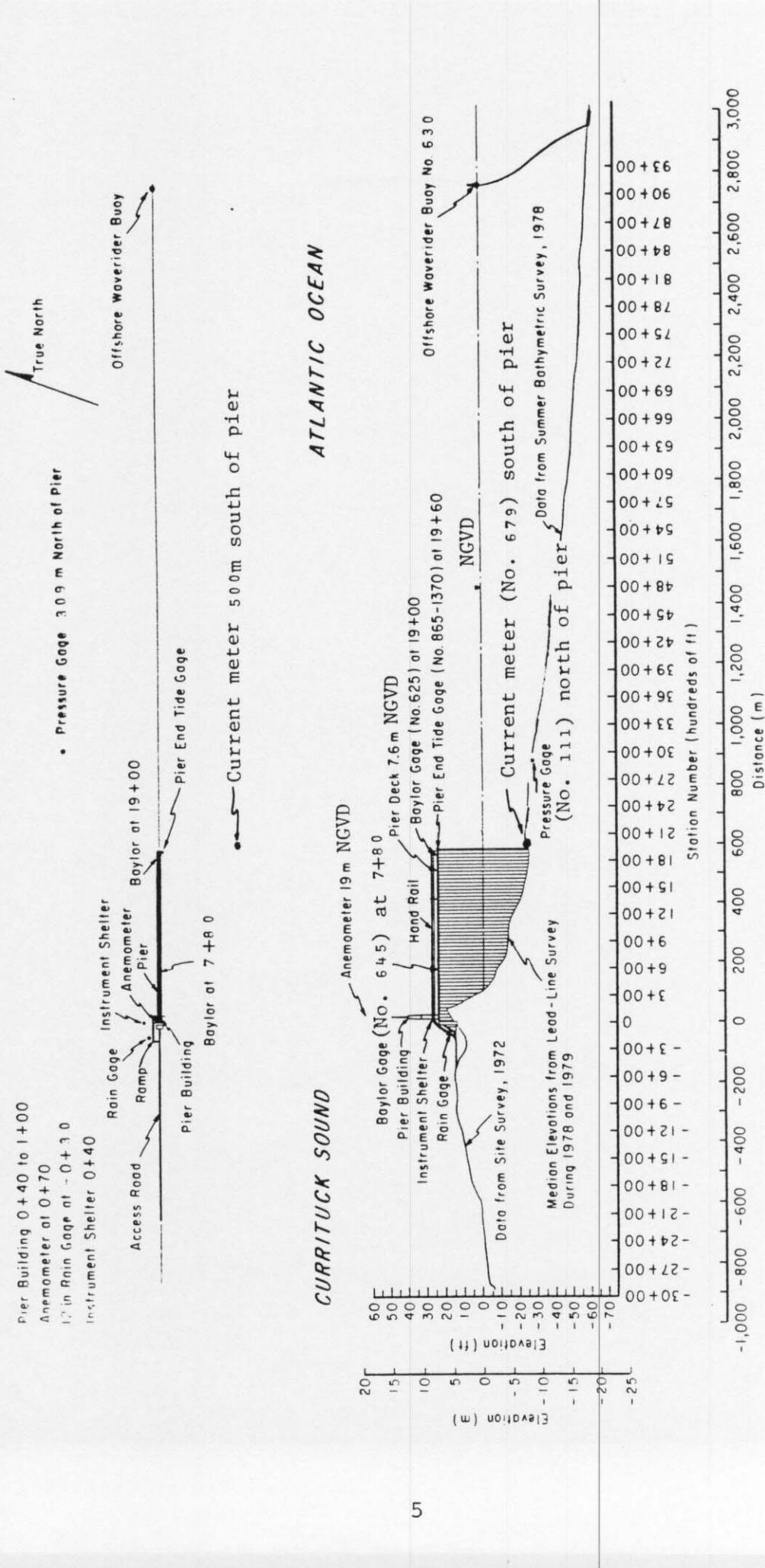


Figure 2. Instrument locations at FRF

PART II: METEOROLOGICAL DATA

A variety of instruments have been installed at the FRF (Figure 2) to monitor the meteorological conditions. The data presented in Table 2 are collected and stored on magnetic tape using a Digital Equipment Corporation VAX 11/750. For each instrument identified in Table 1 as having analog outputs, chart records are obtained, a log is maintained and the records are stored for future reference.

Winds were measured on top of the laboratory building at an elevation of 19 m (Figure 2) using a Weather Measure Skyvane anemometer.

Monthly resultant wind speeds and directions are determined by vector averaging the data. Temperature and atmospheric means are the average of the values presented for the month. Total precipitation is the sum for the month.

The following may be useful for converting the data in Table 2 to other frequently used units of measurement:

1. Millimeters (mm) to inches (in) -
 $mm \times .03937 = in$
2. Millibars (mb) to inches of mercury (in Hg) -
 $mb \times 0.02953 = in Hg$
3. Degrees Celsius (C) to degrees Fahrenheit (F) -
 $(C \times 9/5) + 32 = F$
4. Meters per second (m/s) to knots (kn) -
 $m/s \times 1.943 = kn$

Table 2: Meteorological Data

MAR 1988

Day	Hour	Wind Speed m/sec	Wind Direction deg TN	Temperature deg C	Atm Pressure mb	Precipitation mm
1	100	7	29	7.0	1018.9	0
	700	6	9	6.8	1021.3	0
	1300	3	51	9.1	1022.6	0
	1900	4	17	6.7	1023.3	0
2	100	3	49	4.1	1024.3	0
	700	4	56	5.4	1025.0	0
	1300	3	26	12.6	1023.6	0
	1900	4	44	8.5	1020.9	0
3	100	5	20	10.4	1020.3	0
	700	5	29	9.9	1020.9	0
	1300	3	19	16.3	1020.3	0
	1900	5	84	14.9	1018.2	0
4	100	8	1	15.5	1016.5	0
	700	4	84	15.2	1015.5	0
	1300	6	64	17.1	1009.8	0
	1900	5	26	15.6	1009.1	0
5	100	11	4	7.1	1016.9	0
	700	11	12	5.9	1023.0	0
	1300	11	23	4.5	1025.7	0
	1900	8	34	4.9	1025.7	0
6	100	9	40	5.9	1024.3	0
	700	8	52	6.9	1022.3	0
	1300	6	15	7.9	1019.6	0
	1900	6	19	7.9	1016.5	0
7	100	4	20	8.1	1015.9	5
	700	3	75	6.8	1018.6	0
	1300	2	20	10.5	1020.9	0
	1900	4	32	9.2	1021.9	0
8	100	4	14	9.8	1024.7	0
	700	6	47	8.1	1027.4	0
	1300	4	20	9.7	1027.0	0
	1900	3	95	8.4	1025.0	0
9	100	3	26	9.4	1021.6	0
	700	6	82	13.5	1018.2	0
	1300	6	80	17.9	1012.5	0
	1900	5	81	15.3	1007.7	0
10	100	7	34	15.6	1000.6	0
	700	3	89	14.4	999.3	0
	1300	10	9	8.3	1000.3	4
	1900	9	26	6.9	1005.0	0
11	100	15	7	6.2	1011.1	0
	700	10	24	6.1	1017.9	0
	1300	4	44	7.0	1020.6	0
	1900	4	50	5.7	1020.9	0
12	100	4	3	7.7	1020.9	0
	700	3	99	8.5	1021.3	0
	1300	9	2	17.4	1016.9	0
	1900	6	87	15.3	1012.8	0
13	100	7	95	16.0	1009.8	0
	700	9	2	16.5	1007.0	0
	1300	4	54	10.5	1003.7	6
	1900	3	46	9.9	1002.3	0
14	100	9	52	8.3	1004.0	0
	700	11	8	5.2	1005.4	0
	1300	7	20	5.8	1003.0	0
	1900					0
15	100		Operator Error			0
	700					0
	1300	6	96	3.8	1008.1	0
	1900	7	94	2.4	1011.1	0
16	100	10	91	0.7	1013.1	0
	700	8	94	-0.1	1015.5	0
	1300	6	96	6.2	1015.5	0
	1900	4	71	6.2	1017.2	0

(Continued)

(Sheet 1 of 2)

Table 2: Meteorological Data

MAR 1988

Day	Hour	Wind Speed m/sec	Wind Direction deg TN	Temperature deg C	Atm Pressure mb	Precipitation mm
17	100	5	24	3.5	1020.3	0
	700	7	95	2.1	1022.3	0
	1300	6	41	6.4	1021.6	0
	1900	3	24	5.4	Gage	0
18	100	3	53	4.6	Inoperative	0
	700	1	96	5.9		0
	1300	5	22	10.7	1017.9	0
	1900	3	32	9.3	1013.5	0
19	100	9	1	7.5	1007.7	12
	700	12	57	6.5	1005.7	8
	1300	7	44	6.5	1007.7	0
	1900	7	51	6.7	1009.4	0
20	100	6	42	6.3	1012.1	0
	700	8	40	5.9	1012.5	0
	1300	12	47	12.9	1011.1	0
	1900	7	60	7.2	1015.2	0
21	100	6	42	7.1	1018.6	0
	700	11	49	5.7	1019.9	0
	1300	12	20	2.6	1022.6	0
	1900	8	13	1.9	1026.7	0
22	100	5	44	2.5	1029.1	0
	700	4	24	2.9	1031.4	0
	1300	5	43	5.1	1032.4	0
	1900	5	89	4.2	1032.8	0
23	100	7	92	5.1	1033.1	0
	700	6	91	6.9	1034.1	0
	1300	5	27	11.7	1032.1	0
	1900	6	60	13.5	1030.4	0
24	100	5	77	13.1	1029.1	0
	700	4	86	13.7	1029.4	0
	1300	5	95	20.4	1027.4	0
	1900	6	81	17.2	1026.3	0
25	100	4	81	15.2	1026.3	0
	700	5	48	12.1	1026.7	0
	1300	7	77	20.4	1024.7	0
	1900	6	71	17.5	1023.6	0
26	100	6	74	16.8	1021.9	0
	700	7	74	17.5	1020.3	0
	1300	8	84	18.9	1016.2	0
	1900	8	80	17.8	1012.1	3
27	100	8	66	12.9	1012.5	0
	700	6	40	12.4	1014.5	0
	1300	8	49	17.4	1014.8	0
	1900	3	36	10.2	1018.6	0
28	100	5	15	9.1	1021.9	0
	700	7	34	8.7	1027.4	0
	1300	3	79	10.9	1028.4	0
	1900	4	84	7.9	1027.7	0
29	100	3	36	9.1	1027.7	0
	700	3	23	10.4	1028.0	0
	1300	6	22	14.1	1026.7	0
	1900	4	44	12.1	1025.0	0
30	100	4	3	14.6	1024.0	0
	700	4	92	15.0	1025.0	0
	1300	3	16	16.9	1024.3	0
	1900	5	76	17.2	1023.6	0
31	100	5	15	16.1	1023.3	0
	700	4	22	16.0	1024.0	0
	1300	3	20	18.3	1024.3	0
	1900	4	10	11.6	1023.3	0
		Resultant 6	45	Mean 9.9	Mean 1019.1	Total 38

(Sheet 2 of 2)

PART III: WAVE DATA

Wave data are collected from two Baylor staff gages (Gages 625 and 645), a pressure wave gage (Gage 111) and a Waverider buoy (Gage 630) as shown in Table 1 and Figure 2. The data are collected, analyzed, and stored on magnetic tape using a Digital Equipment Corporation VAX 11/750 programmed to sample the wave gages every 6 hrs (more frequently during storms) near 0100, 0700, 1300, and 1900 EST. The sampling rate is two times per second for 34 minutes.

Wave height H_{mo} is an energy-based statistic equal to four times the standard deviation of the sea surface elevations. Wave height reported from the pressure gage has been compensated for hydrodynamic attenuation using linear wave theory. Wave period is identified from the computation of a variance (energy) spectrum with 60 deg of freedom calculated from a 34-min record. Peak wave period T_p is defined as the period associated with the maximum energy in the spectrum. When this analysis is complete, the data are written to magnetic tape.

Table 3 presents the wave heights and periods for each wave record obtained at 6 hr intervals during the month. The monthly means and standard deviations from the means shown in Table 3 are average values computed from this data. Figure 3 is a time history of all H_{mo} and T_p values obtained for all gages.

Differences in wave periods between wave gages (Table 3 and Figure 3) may be the result of wave breaking, wave reformation, or the presence of multiple wave trains containing nearly equal energy.

Table 3: Wave Data

Mar 1988

Day	Hour	645		625		111		630	
		Baylor	at 7+80	Baylor	at 19+00	Pressure	Gage	Farshr	Wvrdr
		Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec
1	0100	0.67	10.67	1.26	11.13	1.47	10.67	1.26	11.13
	0700	0.66	10.24	1.06	10.67	1.08	9.85	1.13	10.24
	1300	0.66	10.67	0.93	10.24	1.00	10.24	1.01	10.24
	1900	0.42	10.67	0.88	10.24	0.93	9.85	0.89	9.85
2	0100	0.53	11.64	0.88	12.19	0.92	12.19	0.95	11.64
	0700	0.45	12.19	0.87	12.19	0.86	11.64	0.88	11.64
	1300	0.42	12.19	0.78	12.19	0.89	11.64	0.87	11.64
	1900	0.39	12.19	0.72	11.64	0.84	11.64	0.84	11.64
3	0100	0.39	11.64	0.72	11.64	0.76	11.64	0.90	11.64
	0700	0.51	12.19	0.70	11.64	0.77	11.64	0.98	6.09
	1300	0.28	12.19	0.56	11.64	0.66	11.64	0.65	11.64
	1900	0.28	11.64	0.45	11.64	0.50	11.64	0.57	11.13
4	0100	0.24	12.19	0.39	12.19	0.44	11.64	0.56	11.13
	0700	0.33	11.64	0.48	11.64	0.54	11.64	0.69	5.82
	1300	0.34	11.64	0.47	11.64	0.49	11.64	0.70	6.56
	1900	0.39	11.64	0.59	7.31	0.66	11.64	0.85	6.92
5	0100	0.98	4.83	1.17	4.66	1.27	4.57	1.39	4.57
	0700	1.27	5.57	1.42	5.45	1.49	5.69	1.64	5.45
	1300	1.07	6.40	1.66	6.74	1.74	6.92	1.80	6.40
	1900	1.09	6.40	1.32	7.53	1.40	6.74	1.41	6.56
6	0100	0.92	7.53	1.19	7.31	1.18	7.31	1.33	7.76
	0700	0.98	6.74	1.25	4.57	1.26	7.31	1.45	6.24
	1300	0.92	5.33	1.22	5.82	1.18	5.12	1.30	5.22
	1900	0.79	4.92	1.21	6.92	1.18	5.12	1.34	7.11
7	0100	0.89	4.20	1.08	7.11	1.16	7.31	1.40	7.11
	0700	0.53	6.40	0.84	6.24	0.85	6.40	1.05	6.40
	1300	0.39	11.13	0.61	8.83	0.65	9.14	0.61	9.85
	1900	0.25	10.67	0.49	8.53	0.55	8.26	0.55	9.48
8	0100	0.23	9.85	0.42	8.53	0.45	10.67	0.44	8.83
	0700	0.39	2.69	0.51	8.83	0.40	8.83	0.53	11.13
	1300	0.36	3.51	0.49	8.26	0.50	3.41	0.58	8.83
	1900	0.42	3.88	0.64	6.40	0.69	5.95	0.81	6.09
9	0100	0.36	4.34	0.61	7.53	0.62	7.76	0.61	7.11
	0700	0.26	11.13	0.49	7.53	0.53	8.53	0.56	8.26
	1300	0.40	5.33	0.59	8.26	0.60	8.00	0.80	3.28
	1900	0.47	6.40	0.69	6.56	0.78	9.48	1.04	6.24
10	0100	0.55	6.56	0.75	6.74	0.83	10.24	1.14	6.24
	0700	0.46	8.83	0.69	8.83	0.75	10.24	0.96	6.92
	1300	0.89	4.06	1.12	4.13	1.13	4.41	1.22	4.34
	1900	1.08	5.45	1.42	5.33	1.44	5.57	1.54	5.33
11	0100	1.46	6.24	1.94	6.40	2.15	6.24	2.23	5.57
	0700	1.13	7.11	1.66	6.92	1.77	7.31	1.97	6.40
	1300	1.04	7.11	1.29	6.92	1.37	7.53	1.52	7.31
	1900	0.72	7.53	1.00	7.31	1.07	6.92	1.15	7.31
12	0100	0.46	5.69	0.74	9.14	0.87	9.85	0.86	9.48
	0700	0.34	11.13	0.64	8.53	0.66	8.53	0.74	8.53
	1300	0.31	9.85	0.54	8.00	0.63	8.26	0.77	9.85
	1900	0.32	9.48	0.48	9.14	0.50	9.48	0.70	9.14
13	0100	0.33	8.26	0.50	8.53	0.51	8.83	0.75	8.00
	0700	0.35	6.92	0.48	7.31	0.50	7.76	0.71	6.56
	1300	0.35	6.92	0.50	7.31	0.51	6.56	0.59	6.74
	1900	0.28	8.00	0.42	7.53	0.46	7.11	0.59	7.11
14	0100	0.62	4.06	0.74	4.00	0.74	4.20	1.11	4.13
	0700	1.17	5.69	1.36	5.12	1.41	5.33	1.71	5.45
	1300	0.98	5.82	1.06	6.24	1.12	5.95	1.22	6.09
	1900								
15	0100			Operator Error					
	0700								
	1300	0.96	5.69	0.86	5.69	0.94	6.09	1.15	6.09
	1900	0.75	5.45	0.67	5.69	0.73	5.69	1.11	5.45
16	0100	0.68	5.02	0.62	7.76	0.67	4.92	1.12	5.02
	0700	0.92	5.95	0.82	5.82	0.90	6.09	1.17	5.95
	1300	1.02	5.69	0.94	5.69	0.97	5.69	1.13	5.69
	1900	0.70	5.69	0.79	8.83	0.84	9.14	0.90	9.48

* Electronic problems

(Continued)

(Sheet 1 of 2)

Table 3: Wave Data

Mar 1988

Day	Hour	645		625		111		630	
		Baylor	at 7+80	Baylor	at 19+00	Pressure Gage		Farshr	Wvrdr
		Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec
17	0100	0.55	5.22	0.68	10.24	0.68	10.24	0.83	9.85
	0700	0.95	5.57	0.94	5.95	0.96	5.95	1.17	5.69
	1300	0.74	5.45	0.75	9.85	0.73	10.24	0.87	5.45
	1900	0.68	5.45	0.79	10.24	0.75	10.24	0.77	10.24
18	0100	0.47	10.67	0.67	10.67	0.67	9.85	0.74	11.13
	0700	0.41	11.13	0.56	11.13	0.60	10.67	0.54	10.67
	1300	0.29	11.13	0.48	10.67	0.55	10.67	0.53	10.24
	1900	0.29	10.24	0.46	10.24	0.51	9.85	0.50	10.24
19	0100	0.48	2.48	0.55	9.85	0.45	10.24	0.58	10.24
	0700	1.20	4.57	1.34	4.49	1.55	4.57	1.74	4.83
	1300	1.02	5.45	1.18	5.95	1.36	5.69	1.44	5.69
	1900	0.82	5.33	1.09	11.13	1.17	11.13	1.33	10.67
20	0100	0.43	9.85	0.64	9.85	0.68	9.48	0.81	9.14
	0700	0.30	9.85	0.47	9.85	0.52	9.48	0.63	9.14
	1300	0.22	9.85	0.37	9.85	0.46	9.48	0.79	10.24
	1900	0.54	2.91	0.73	9.85	0.65	10.24	0.75	9.48
21	0100	0.48	4.92	0.58	4.66	0.59	9.48	0.69	9.48
	0700	1.03	5.02	1.08	4.13	1.10	4.83	1.28	4.13
	1300	1.20	6.09	1.63	5.95	1.67	5.95	1.86	5.69
	1900	1.03	5.95	1.16	6.09	1.16	5.45	1.37	5.82
22	0100	0.77	5.69	0.84	5.95	0.81	5.57	0.91	6.56
	0700	0.66	5.45	0.77	5.69	0.78	6.24	0.85	5.33
	1300	0.66	5.45	0.76	7.76	0.77	5.82	0.85	4.92
	1900	0.80	5.69	0.86	6.24	0.87	5.95	0.97	6.09
23	0100	0.62	5.45	0.81	6.24	0.80	6.24	0.90	6.24
	0700	0.57	3.56	0.71	5.69	0.71	7.76	0.79	6.09
	1300	0.43	4.66	0.62	6.92	0.63	6.92	0.70	7.76
	1900	0.40	2.64	0.57	7.11	0.55	6.74	0.65	7.11
24	0100	0.36	4.34	0.50	4.57	0.54	7.76	0.64	8.00
	0700	0.29	14.22	0.46	6.24	0.51	5.45	0.54	6.40
	1300	0.34	5.02	0.48	5.12	0.51	5.12	0.68	5.45
	1900	0.32	5.45	0.44	5.57	0.44	8.26	0.61	5.82
25	0100	0.30	5.02	0.44	5.12	0.44	5.33	0.59	5.22
	0700	0.28	5.22	0.41	5.45	0.44	5.57	0.60	5.69
	1300	0.46	2.75	0.55	5.33	0.49	5.57	0.62	5.33
	1900	0.34	2.98	0.46	5.33	0.46	5.82	0.59	5.45
26	0100	0.52	5.57	0.67	5.82	0.73	5.57	0.87	5.82
	0700	0.62	6.24	0.72	6.74	0.80	6.74	0.99	6.40
	1300	0.78	7.11	0.93	7.11	1.00	7.31	1.36	6.56
	1900	0.82	7.31	0.94	7.76	0.99	7.11	1.42	7.31
27	0100	0.65	8.00	0.92	8.26	1.06	8.26	1.41	8.00
	0700	0.70	8.53	0.93	8.53	0.90	8.83	1.13	8.53
	1300	0.52	8.83	0.77	8.83	0.94	8.83	1.13	8.83
	1900	0.61	8.53	0.79	8.83	0.88	8.53	1.01	8.83
28	0100	0.59	9.14	0.85	9.14	0.92	9.48	0.96	8.83
	0700	0.67	9.48	0.97	9.14	0.92	9.14	1.12	9.48
	1300	0.67	4.74	0.93	9.85	0.94	8.83	1.01	9.48
	1900	0.58	9.85	0.76	9.85	0.78	9.85	0.81	10.24
29	0100	0.48	9.85	0.76	10.24	0.82	9.14	0.86	9.48
	0700	0.42	9.48	0.60	10.24	0.70	9.85	0.68	9.14
	1300	0.40	9.48	0.58	9.48	0.65	8.53	0.68	9.85
	1900	0.41	9.48	0.62	9.85	0.63	9.85	0.72	9.14
30	0100	0.39	9.85	0.57	8.83	0.63	9.85	0.67	9.48
	0700	0.33	9.85	0.49	9.48	0.56	10.24	0.55	10.24
	1300	0.31	9.85	0.49	9.48	0.55	9.48	0.58	9.14
	1900	0.33	9.85	0.51	9.85	0.50	9.85	0.63	9.14
31	0100	0.28	9.85	0.44	8.83	0.50	9.48	0.60	9.48
	0700	0.32	9.48	0.55	10.24	0.62	9.85	0.66	8.26
	1300	0.39	9.48	0.67	7.11	0.74	7.76	0.80	7.76
	1900	0.51	8.83	0.79	9.85	0.84	8.53	0.86	9.14
Mean		0.59	7.52	0.78	8.04	0.83	8.15	0.95	7.79
Std dev		0.28	2.78	0.31	2.19	0.33	2.17	0.35	2.11

* Electronic problems

(Sheet 2 of 2)

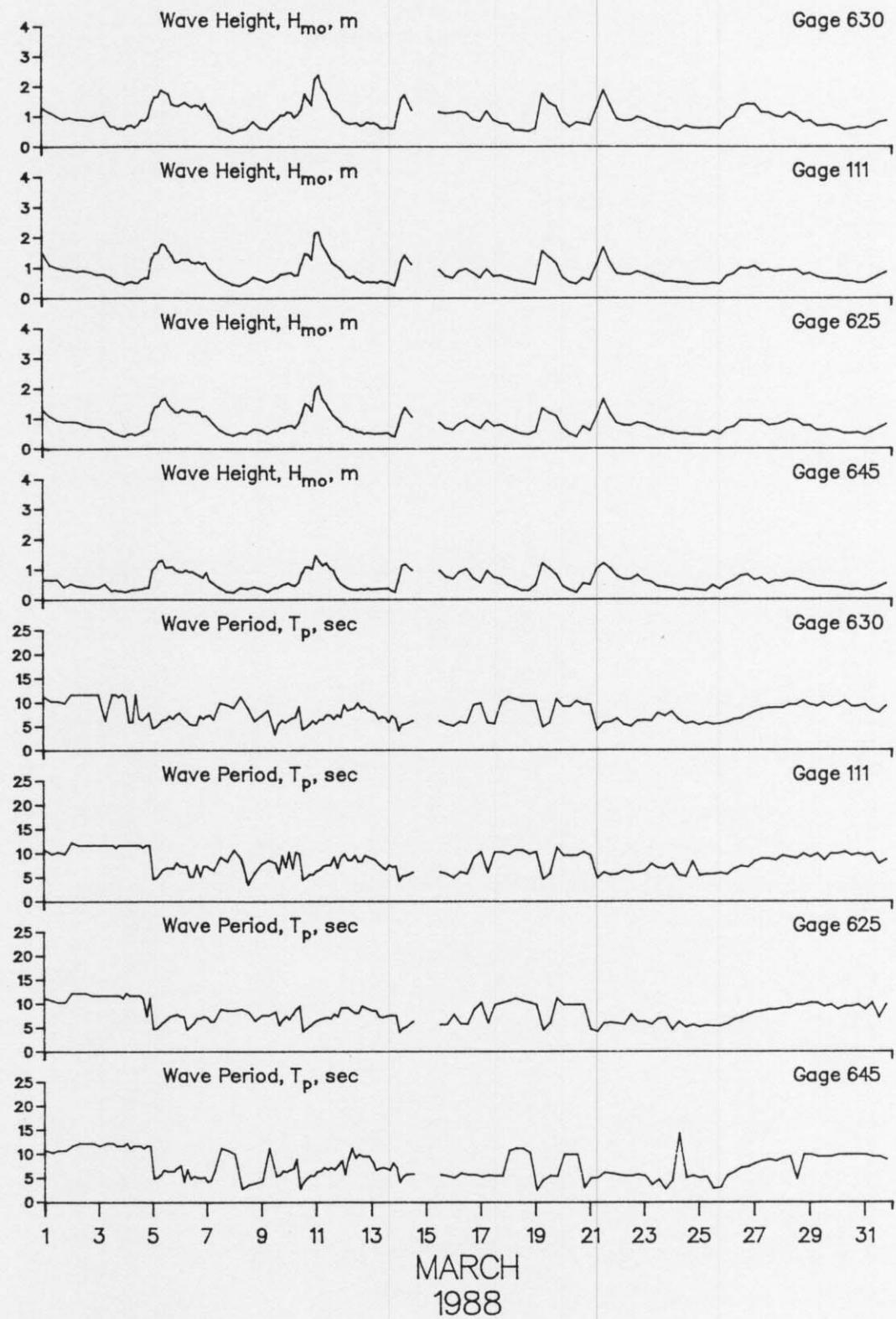


Figure 3. Time history of wave heights and periods

PART IV: CURRENT DATA

Current data (Table 4) are collected from a Marsh-McBirney electromagnetic biaxial current meter (Table 1 and Figure 2) and by visually observing the movement of dye on the water surface in the surf and at the seaward end of the pier, as well as 500 m updrift of the pier 12 m offshore.

Since the shoreline orientation is approximately N20W, longshore currents flow either toward 340 deg (i.e. northward) or toward 160 deg (i.e. southward). Similarly, cross-shore currents are either onshore (westward) or offshore (eastward).

All current speeds are given in centimeters per second (cm/sec). Resultant speeds and directions are determined by vector averaging the data.

Table 4: Current Data
Mar 1988

Day	Pier Measurements				Beach Measurements (500m Updrift)				Current Meter at South Tripod Depth -4.8m (NGVD) ID #679			
	Alongshore Cross-shore Resultant Time	Dye at (579 m) (surface)	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed	Dir	Speed	Dir
1 0100-Along Cross Result											12	N
1 0700-Along Cross Result	9 0	S 160	152	16 5	N off		0	South	1		1	off
1 1300-Along Cross Result	9			17	357				2		2	97
1 1900-Along Cross Result									2		4	off
1 1900-Along Cross Result									4		4	43
2 0100-Along Cross Result									7		7	S
2 0700-Along Cross Result	12 0	N 340	152	41 0	N 340		25	N	0		0	off
2 1300-Along Cross Result	12			41					2		2	70
2 1900-Along Cross Result									2		7	160
3 0100-Along Cross Result									0		0	
3 0700-Along Cross Result	38 0	N 340	152	36 5	N off		24	N	7		7	340
3 1300-Along Cross Result	38			36	349				12		12	335
3 1900-Along Cross Result									11		11	325
3 1900-Along Cross Result									1		1	on
4 0100-Along Cross Result									12		12	335
4 0700-Along Cross Result	32 10	N off 357	140	21 4	N off		18	N	12		12	N
4 1300-Along Cross Result	33			21	351				1		1	on
4 1900-Along Cross Result									10		10	303
5 0100-Along Cross Result									11		11	N
5 0700-Along Cross Result	55 0	S 160	152	102 0	S		127	S	1		4	on
5 1300-Along Cross Result	55			102	160				10		10	316
5 1900-Along Cross Result									24		24	S
5 1900-Along Cross Result									4		4	off
5 1900-Along Cross Result									24		24	151
5 1900-Along Cross Result									7		7	off
5 1900-Along Cross Result									26		26	144
5 1900-Along Cross Result									10		10	
5 1900-Along Cross Result									27		27	138
5 1900-Along Cross Result									19		19	S
5 1900-Along Cross Result									7		7	off
5 1900-Along Cross Result									20		20	140

KEY = All speeds in CM/SEC

N = Northward, Shore parallel

S = Southward, Shore parallel

on = onshore off = offshore

Table 4: Current Data
Mar 1988

Alongshore Cross-shore Resultant Time	Pier Measurements						Beach Measurements			Current Meter	
	Dye at (579 m) (surface)		Dye at Mid-Surf Zone (surface)		(500m Updrift)			at South Tripod		Depth -4.8m (NGVD)	ID #679
Day	Speed	Dir	Distance from Baseline (m)	Speed	Dir	Location	Speed	Dir	Speed	Dir	
6 0100-Along Cross Result									14	S	
6 0700-Along Cross Result	20 6 21	S on 177		19 0 19	N 340				5	off	
6 1300-Along Cross Result									15	140	
6 1900-Along Cross Result									12	S	
7 0100-Along Cross Result									5	off	
7 0700-Along Cross Result	0 2 2		152	27 12 29	N off 4		127		13	137	
7 1300-Along Cross Result									14	S	
7 1900-Along Cross Result									5	off	
8 0100-Along Cross Result									15	140	
8 0700-Along Cross Result	14 3 14	S on 174		4 2 5	N off 11				10	S	
8 1300-Along Cross Result									3	off	
8 1900-Along Cross Result									10	143	
9 0100-Along Cross Result									19	S	
9 0700-Along Cross Result	24 10 26	N off 2	152	34 0 34	N 340				5	off	
9 1300-Along Cross Result									20	145	
9 1900-Along Cross Result									19	S	
10 0100-Along Cross Result									5	off	
10 0700-Along Cross Result	11 8 14	S on 195		44 2 44	N on 337				1	140	
10 1300-Along Cross Result									3	S	
10 1900-Along Cross Result									3	on	

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on = onshore off = offshore

Table 4: Current Data
Mar 1988

Day	Alongshore Cross-shore Resultant Time	Pier Measurements				Beach Measurements (500m Updrift)			Current Meter at South Tripod	
		Dye at (579 m) (surface)	Distance from Baseline (m)	Dye 12m offshore (surface)	Location	Speed	Dir	Depth -4.8m (NGVD)	ID #679	
Speed	Dir	Speed	Dir	Speed	Dir	Speed	Dir	Speed	Dir	
11 0100-Along Cross Result								34	S	
11 0700-Along Cross Result	34 12 36	S on 179	165	102 10 102	S on 166	61	S	7	off	
11 1300-Along Cross Result								35	148	
11 1900-Along Cross Result								26	S	
12 0100-Along Cross Result								6	off	
12 0700-Along Cross Result	29 4 29	N off 349	152	51 0 51	N 340	70	N	27	147	
12 1300-Along Cross Result								16	S	
12 1900-Along Cross Result								5	off	
13 0100-Along Cross Result								17	143	
13 0700-Along Cross Result	28 25 37	N off 22	152	61 0 61	N 340	45	N	3	N	
13 1300-Along Cross Result								4	off	
13 1900-Along Cross Result								5	on	
14 0100-Along Cross Result								10	on	
14 0700-Along Cross Result	68 14 69	S on 171	152	102 10 102	S on 166	66	S	3	33	
14 1300-Along Cross Result								12	323	
14 1900-Along Cross Result								10	N	
15 0100-Along Cross Result								3	on	
15 0700-Along Cross Result	36 11 37	S off 143	152	44 22 49	S off 133	56	S	12	32	
15 1300-Along Cross Result								17	322	
15 1900-Along Cross Result								17	32	

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S = Southward, Shore parallel
on = onshore off = offshore

Table 4: Current Data
Mar 1988

Alongshore Cross-shore Resultant Time	Pier Measurements						Beach Measurements			Current Meter	
	Dye at (579 m) (surface)		Dye at Mid-Surf Zone (surface)		(500m Updrift)			at South Tripod Depth -4.8m (NGVD) ID #679			
Day	Speed	Dir	Distance from Baseline (m)	Speed	Dir	Location	Speed	Dir	Speed	Dir	
16 0100-Along Cross Result									12	S	
									1	off	
									12	155	
16 0700-Along Cross Result	51	S		76	S				14	S	
	10	off	152	0		North	61	S	2	off	
	52	149		248	88				14	152	
16 1300-Along Cross Result									11	S	
									6	off	
									13	131	
16 1900-Along Cross Result									15	S	
									5	off	
									16	142	
17 0100-Along Cross Result									9	S	
									2	off	
									9	147	
17 0700-Along Cross Result	29	S		51	S				3	S	
	9	off	152	18	off	North	61	S	0		
	30	143		54	141				3	160	
17 1300-Along Cross Result									7	S	
									2	off	
									7	144	
17 1900-Along Cross Result									4	S	
									1	on	
									4	174	
18 0100-Along Cross Result									6	N	
									2	on	
									6	322	
18 0700-Along Cross Result	11	N		3	N				6	N	
	7	off	140	2	off	South	18	N	2	on	
	13	11		3	11				6	322	
18 1300-Along Cross Result									8	N	
									3	off	
									9	1	
18 1900-Along Cross Result									0		
									0		
									0		
19 0100-Along Cross Result									2	S	
									6	off	
									6	88	
19 0700-Along Cross Result	47	S		76	S				23	S	
	5	on	152	11	on	North	48	S	3	off	
	47	166		77	169				23	153	
19 1300-Along Cross Result									25	S	
									2	off	
									25	155	
19 1900-Along Cross Result									7	S	
									1	on	
									7	168	
20 0100-Along Cross Result									3	S	
									0		
									3	160	
20 0700-Along Cross Result	19	N		16	N				13	N	
	14	off	128	5	off	South	6	N	0		
	24	17		16	357				13	340	
20 1300-Along Cross Result									3	N	
									7	on	
									8	273	
20 1900-Along Cross Result									5	N	
									11	off	
									12	46	

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S = Southward, Shore parallel
on = onshore off = offshore

Table 4: Current Data
Mar 1988

Alongshore Cross-Shore Resultant Time Day	Pier Measurements				Beach Measurements (500m Updrift)				Current Meter at South Tripod	
	Dye at (579 m) (surface)	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed Dir	Dye 12m offshore (surface)	Location	Speed Dir	Depth -4.8m (NGVD) ID #679	Speed	Dir
21 0100-Along Cross Result									8	N
21 0700-Along Cross Result	12 14 19	S on 210	152	76 23 80	S on 177	North	70 S		8	off
21 1300-Along Cross Result									11	25
21 1900-Along Cross Result									2	N
22 0100-Along Cross Result									1	off
22 0700-Along Cross Result	34 8 35	S on 174	152	36 0 36	S 160	North	38 S		2	7
22 1300-Along Cross Result									28	S
22 1900-Along Cross Result									6	off
23 0100-Along Cross Result									29	148
23 0700-Along Cross Result	30 6 31	S on 171	152	38 15 41	N off 2	South	8 N		14	S
23 1300-Along Cross Result									2	off
23 1900-Along Cross Result									2	152
24 0100-Along Cross Result									9	S
24 0700-Along Cross Result	25 8 27	N off 357	152	51 8 51	N off 349	South	38 S		3	off
24 1300-Along Cross Result									3	142
24 1900-Along Cross Result									5	S
25 0100-Along Cross Result									1	on
25 0700-Along Cross Result	29 0 29	N on 340	152	61 0 61	N 340	South	29 N		3	322
25 1300-Along Cross Result									10	N
25 1900-Along Cross Result									2	on
									10	329
									7	N
									1	on
									7	329
									8	N
									2	on
									8	326
									8	N
									4	on
									9	313

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Table 4: Current Data
Mar 1988

Alongshore Cross-shore Resultant Time	Pier Measurements				Beach Measurements			Current Meter			
	Dye at (579 m) (surface)	Speed	Dir	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed	Dir
Day											
26 0100-Along Cross Result										9	N
										3	on
										9	322
26 0700-Along Cross Result	34	S			87	N		21	N	17	N
	10	off		152	0					1	on
	35	143			87	340				17	337
26 1300-Along Cross Result										23	N
										2	on
										23	335
26 1900-Along Cross Result										24	N
										2	on
										24	335
27 0100-Along Cross Result										15	N
										5	on
										16	322
27 0700-Along Cross Result	0			122	N			75	N	8	N
	20	off		152	0					2	on
	20	70			122	340				8	326
27 1300-Along Cross Result										9	N
										4	on
										10	316
27 1900-Along Cross Result										4	N
										4	off
										6	25
28 0100-Along Cross Result										10	N
										6	off
										12	11
28 0700-Along Cross Result	12	S		76	N			12	N	0	
	8	on		152	0					4	off
	14	195			76	340				4	70
28 1300-Along Cross Result										13	N
										6	off
										14	5
28 1900-Along Cross Result										3	N
										0	
										3	340
29 0100-Along Cross Result										3	N
										0	
										3	340
29 0700-Along Cross Result	18	N		87	N			18	N	2	S
	0			152	0					3	off
	18	340			87	340				4	104
29 1300-Along Cross Result										13	S
										5	off
										14	139
29 1900-Along Cross Result										12	S
										1	off
										12	155
30 0100-Along Cross Result										2	S
										1	on
										2	187
30 0700-Along Cross Result	16	N		61	N			8	N	2	S
	8	off		152	18	off				1	off
	18	7			64	357				2	133
30 1300-Along Cross Result										1	S
										3	off
										3	88
30 1900-Along Cross Result										4	S
										1	on
										4	174

KEY = All speeds in CM/SEC
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S = Southward, Shore parallel
on = onshore off = offshore

Table 4: Current Data
Mar 1988

Alongshore Cross-shore Resultant Time	Pier Measurements						Beach Measurements			Current Meter	
	Dye at (579 m) (surface)		Dye at Mid-Surf Zone (surface)		(500m Updrift)		Dye 12m offshore (surface)		at South Tripod		
Day	Speed	Dir	Distance (m)	Speed	Dir	Location	Speed	Dir	Depth -4.8m (NGVD)	ID #679	
31 0100-Along Cross Result									2	N	
31 0700-Along Cross Result	0			68	N				1	on	
	3	off	152	10	off	South	35	N	2	313	
	3	70		68	349				1	250	
31 1300-Along Cross Result									2	S	
									2	off	
									3	115	
31 1900-Along Cross Result									14	S	
									5	off	
									15	140	

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PART V: SUPPLEMENTAL OBSERVATIONS

Visual wave direction measurements (Table 5) taken at the seaward end of the pier are made of both the primary wave train (i.e. that having the larger wave heights) and the secondary wave train (which must be clearly distinguishable as a wave train separate from the primary waves but not surface chop or capillary waves). The direction of the primary wave train just north of the seaward end of the pier is also determined using a Raytheon Marine Pathfinder radar and measuring the alignment of the wave crests. The pier axis (considered perpendicular to the beach at the FRF) is orientated 70 deg east of true north; consequently, wave angles greater than 70 deg indicate that the waves were coming from the south side of the pier.

The width of the surf zone (seawardmost breaker position to shoreline) is determined from the pier deck.

Measurements of surface water temperature, density, and visibility are made daily at the seaward end of the FRF pier. A jar along with a thermometer is lowered about 0.3 m into the water and allowed to remain for at least one minute. The jar is removed, the temperature read, and a hydrometer is used to determine the density. A Secchi disc is used to determine the surface visibility.

Table 5: Supplemental Observations

Mar 1988

Day	Time	Wave Approach		Radar Wave Angle deg from True N	Width of Surf Zone,m	Water Characteristics at Pier End		
		Primary	Secondary			Temp.,C	Density g/cc	Secchi Vis.,m
1	0750	80	60	80	79	6.1	1.0232	1.5
2	0800	70			73	6.7	1.0226	2.7
3	0810	80			9	7.2	1.0234	2.1
4	0819	100			9	7.2	1.0225	2.4
5	0730	50		60	98	6.4	1.0258	1.2
6	0749	60		80	85	6.1	1.0250	1.8
7	0730	40			62	6.6	1.0240	1.5
8	0745	50		60	58	7.5	1.0242	2.4
9	0830	50			55	8.4	1.0224	3.4
10	0800	90		50	75	7.8	1.0242	3.4
11	0735	30		80	216	6.7	1.0234	1.8
12	0745	70			85	7.2	1.0236	2.1
13	0808	150			61	4.7	1.0244	2.4
14	0735	20		50	151	6.7	1.0254	3.0
15	0745	10		50	85	5.6	1.0242	1.5
16	0820	25		40	69	6.1	1.0230	2.1
17	0801	20		inoperative	72	6.7	1.0226	2.1
18	0730	30	90	inoperative	47	7.1	1.0230	3.7
19	1010	50		inoperative	104	7.2	1.0242	2.1
20	0915	none visible		inoperative	8	7.2	1.0240	2.7
21	0730	25		inoperative	122	6.6	1.0244	2.1
22	1017	50		inoperative	81	6.7	1.0246	2.7
23	0745	none visible		inoperative	87	6.7	1.0240	3.0
24	0755	100		inoperative	61	7.8	1.0248	3.7
25	0814	100	140	inoperative	40	7.8	1.0252	3.7
26	0830	110	160	inoperative	76	8.9	1.0254	2.7
27	0800	90	70	inoperative	37	8.4	1.0260	3.0
28	0830	40		inoperative	91	8.4	1.0260	4.6
29	0745	90	40	inoperative	62	9.5	1.0258	4.0
30	0700	80	150	inoperative	37	9.7	1.0254	3.0
31	1042	75		inoperative	30	10.0	1.0256	3.0

PART VI: WATER LEVELS

The National Ocean Services (NOS) has established a primary tide station (No. 865-1370) at the seaward end of the FRF pier. A Leupold-Stevens digital recording float-type tide gage is used to collect data every 6 minutes throughout the month.

Figure 4 shows the variation in mean water levels computed over a tidal cycle period (12.42 hours) and contains a list of selected mean and extreme values. This presentation is useful in identifying effects of both meteorological and astronomical forces on the open coast water levels.

Table 6 contains the time of the center of each sampling interval and the range, high, low, and mean water levels during each tidal cycle.

FRF TIDE HEIGHTS

Mar 1988

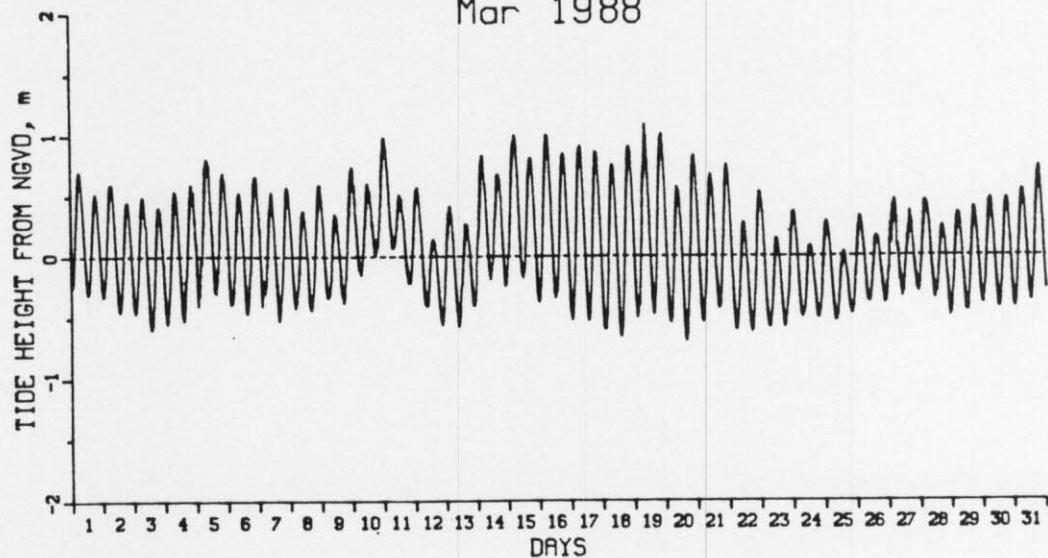


Figure 4. Time history of mean water levels

Monthly Water Levels, m NGVD

Extreme Low = -0.69 on day 20 at 1436 hr
Extreme High = 1.09 on day 19 at 748 hr
Monthly Mean = 0.07
Mean Low = -0.43
Mean High = 0.56
Mean Range = 0.99

Table 6: Water Levels, m NGVD

		Mar 1988			
Mid-Cycle Day	Time	Low	High	Mean	Range
1	612	-0.31	0.70	0.22	1.01
1	1837	-0.33	0.52	0.08	0.85
2	703	-0.45	0.59	0.11	1.05
2	1928	-0.46	0.45	-0.02	0.91
3	753				
3	2018	-0.56	0.41	-0.09	0.97
4	843	-0.52	0.53	0.00	1.06
4	2109	-0.41	0.59	0.09	1.00
5	934	-0.30	0.80	0.26	1.10
5	2159	-0.39	0.69	0.15	1.08
6	1024	-0.47	0.52	0.03	0.99
6	2249	-0.40	0.66	0.15	1.06
7	1115	-0.52	0.53	0.00	1.05
7	2340	-0.42	0.57	0.07	0.99
8	1205	-0.43	0.38	-0.04	0.81
9	30	-0.34	0.58	0.10	0.92
9	1255	-0.38	0.34	-0.02	0.73
10	121	-0.15	0.73	0.26	0.89
10	1346	-0.02	0.60	0.26	0.61
11	211	0.07	0.98	0.51	0.91
11	1436	-0.22	0.51	0.15	0.73
12	301	-0.41	0.57	0.11	0.98
12	1527	-0.56	0.14	-0.18	0.70
13	352	-0.57	0.41	-0.04	0.98
13	1617	-0.50	0.27	-0.10	0.77
14	442	-0.27	0.83	0.29	1.10
14	1707	-0.24	0.67	0.23	0.92
15	532	-0.18	1.00	0.42	1.17
15	1758	-0.38	0.81	0.26	1.19
16	623	-0.34	1.00	0.33	1.34
16	1848	-0.52	0.85	0.19	1.37
17	713	-0.53	0.91	0.20	1.44
17	1938	-0.60	0.86	0.15	1.46
18	804	-0.66	0.76	0.05	1.41
18	2029	-0.55	0.91	0.20	1.45
19	854	-0.48	1.09	0.22	1.57
19	2119	-0.54	1.01	0.26	1.55
20	944	-0.69	0.57	-0.04	1.26
20	2210	-0.54	0.83	0.14	1.37
21	1035	-0.48	0.67	0.09	1.14
21	2300	-0.60	0.75	0.10	1.35
22	1125	-0.62	0.28	-0.20	0.89
22	2350	-0.58	0.53	-0.01	1.11
23	1216	-0.58	0.14	-0.24	0.72
24	41	-0.50	0.37	-0.06	0.87
24	1306	-0.51	0.09	-0.22	0.60
25	131	-0.52	0.28	-0.10	0.81
25	1356	-0.53	0.04	-0.24	0.56
26	222	-0.44	0.33	-0.04	0.77
26	1447	-0.39	0.16	-0.11	0.55
27	312	-0.37	0.46	0.05	0.84
27	1537	-0.33	0.37	0.00	0.70
28	402	-0.35	0.45	0.09	0.80
28	1628	-0.49	0.25	-0.09	0.74
29	453	-0.46	0.35	-0.04	0.81
29	1718	-0.45	0.40	-0.03	0.85
30	543	-0.43	0.47	0.03	0.90
30	1808	-0.42	0.47	0.03	0.89
31	634	-0.39	0.54	0.08	0.93
31	1859	-0.31	0.73	0.24	1.05

PART VII: NEARSHORE PROFILES

A. Nearshore Profiles. In order to document profile response away from the pier, surveys of four profile lines extending 900 to 1,000 m from shore and located 489 and 581 m north and 517 and 608 m south of the FRF pier are conducted bi-weekly, after storms, and during more complete bathymetric surveys.

These profiles are obtained using the CRAB-Zeiss surveying system; a Zeiss Elta-2 first-order, self-recording electronic theodolite distance meter in combination with the Coastal Research Amphibious Buggy (CRAB), a 10.7 m high, self-powered, mobile tripod on wheels.

Figure 5 shows the last survey in February and the three surveys in March on profile line 188, located 517 m south of the pier. The only significant change occurred early in the month when a prominent nearshore bar (140 to 250 m) developed and later disappeared. Only minor changes are visible on the remainder of the profile.

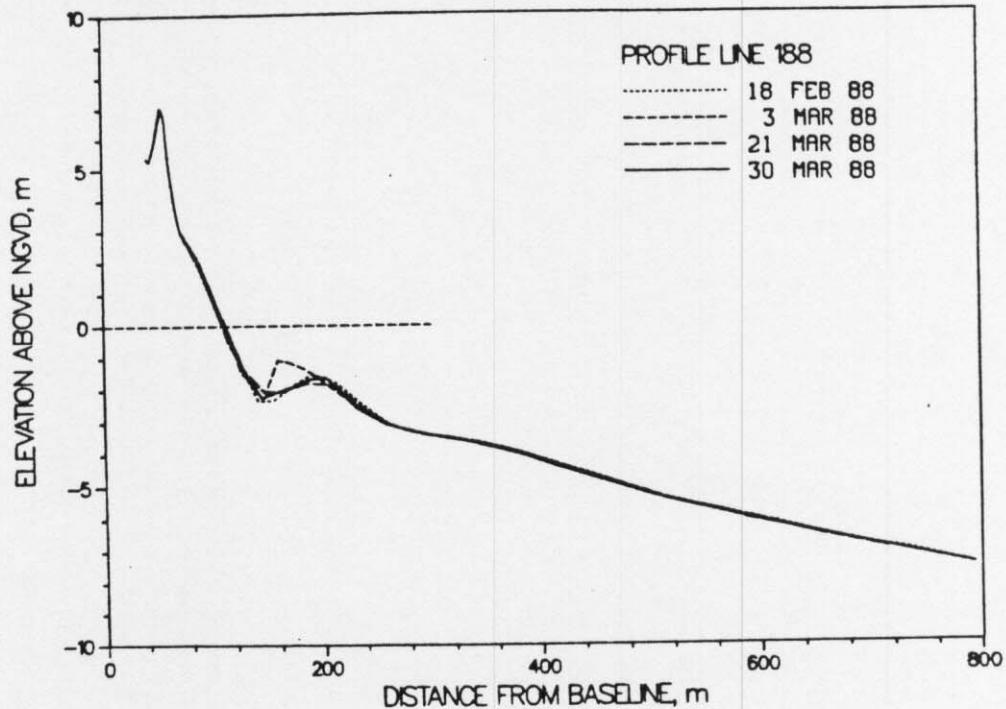


Figure 5. Monthly CRAB profiles on profile 188 - 517 m south of pier.

The profile envelope (Figure 6) reflects the maximum changes that occurred on the profile during 1988. The one change is a result of the nearshore bar developing early in March.

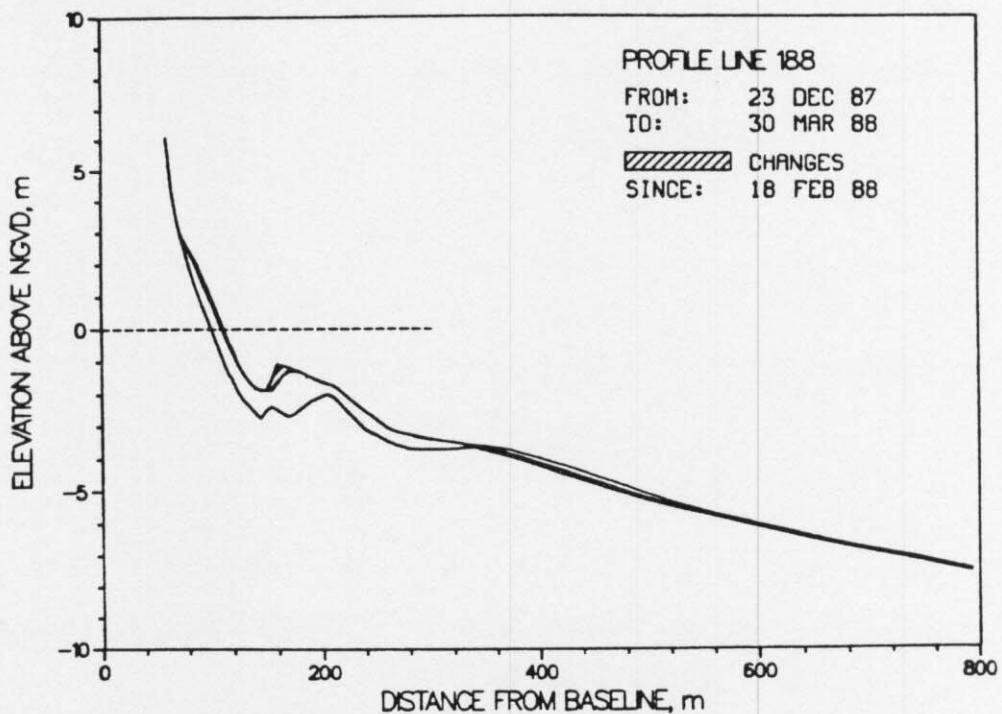


Figure 6. CRAB profile envelope - profile 188.

B. Bathymetry. Figure 7 includes a two- and three-dimensional contour map and a change plot derived from the bathymetric survey conducted on 30 March. Wide contour lines on the change diagram represent areas which eroded; thin lines indicate accretion.

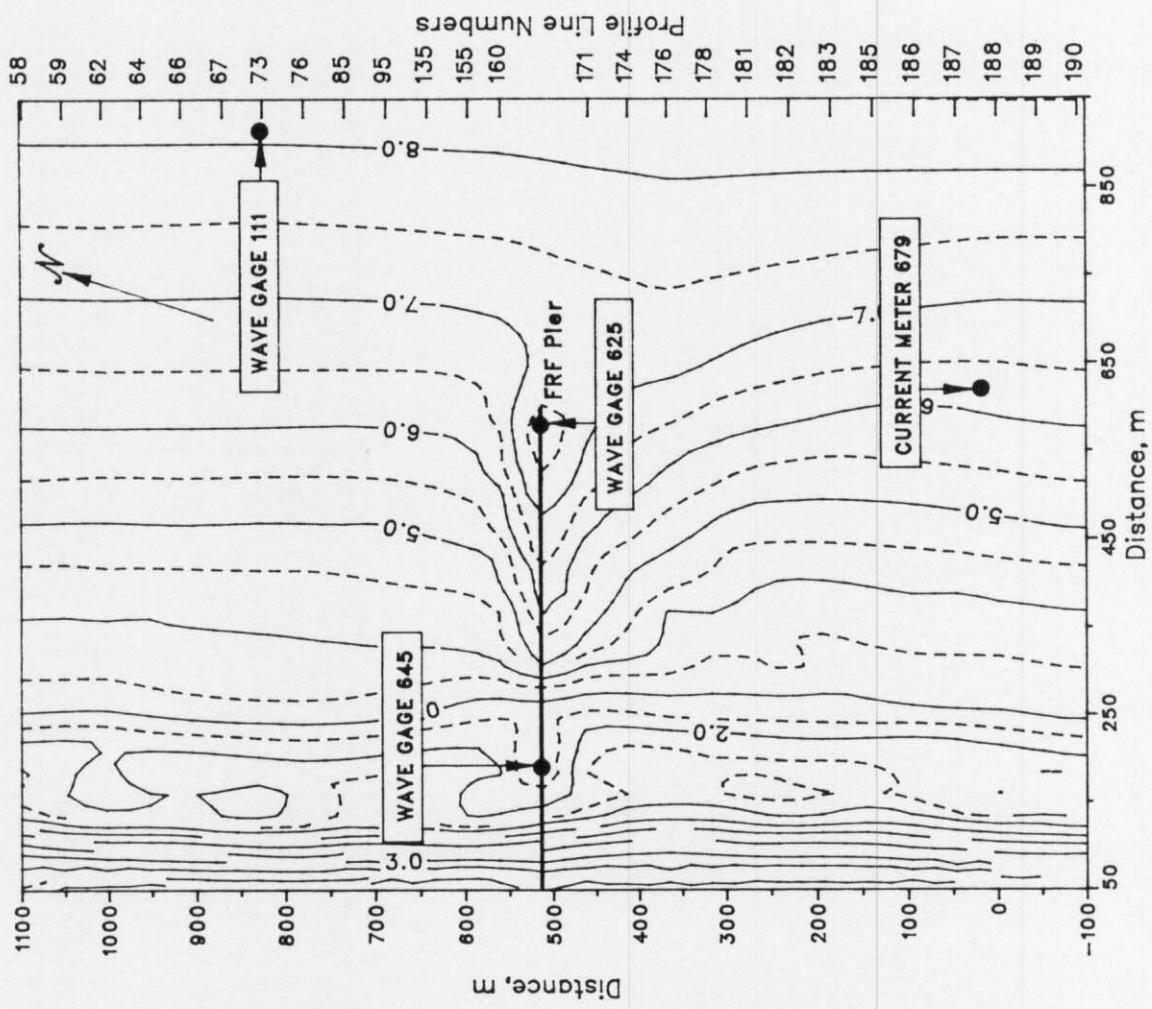
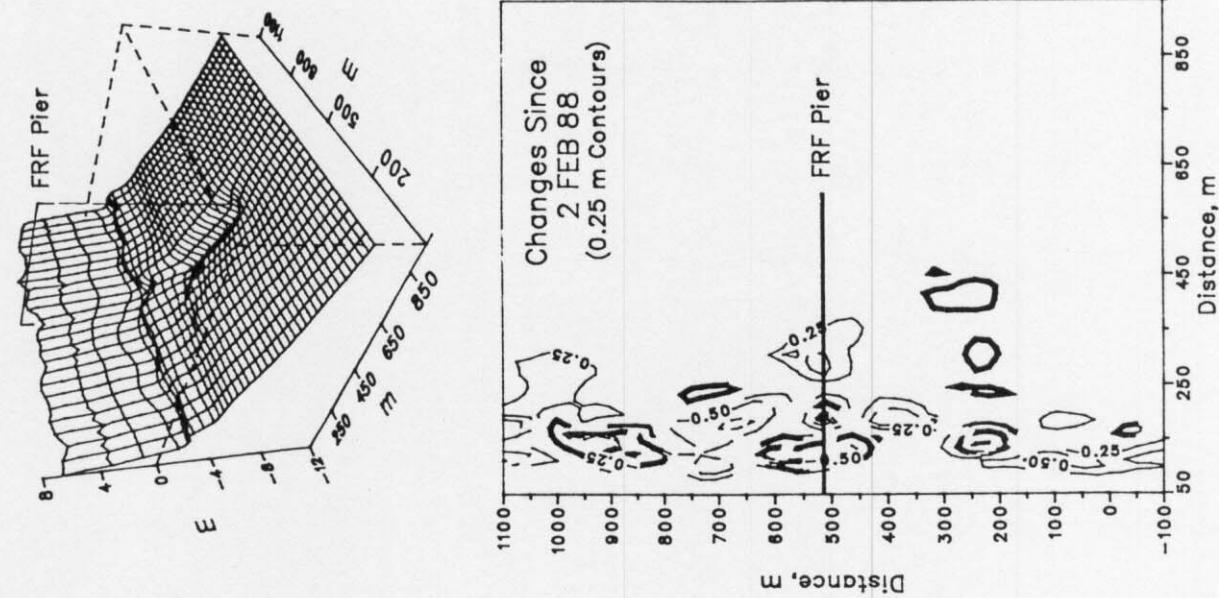


FIGURE 7. FRF Bathymetry 30 Mar 88
(Depths Relative to NGVD)

PART VIII: SPECIAL EVENTS

A. Storm Data Collection. The following list identifies times when the wave height at the seaward end of the pier (i.e. as measured by Gage 625 at pier station 19+00) exceeded 2 m. When this occurred, four contiguous 34-min wave records were obtained every three hours:

<u>Start</u>	<u>End</u>
11 Mar (0134)	11 Mar (0434)

B. Storm Synopsis.

11 March - This weak storm formed over Texas early on 9 March and tracked east. Centered over North Carolina on 10 March, the storm quickly moved offshore. Maximum wind speeds (from north-northeast) exceeded 15 m/s at 2342 hr on 10 March. Wave heights exceeded 2 m only 3 hours with the maximum H_{mo} of 2.2 m ($T_p = 6.9$ sec) occurring at 0208 hr on 11 March. The lowest barometric pressure of 999.2 mb was recorded at 0842 hr on 10 March. Precipitation totalled 4 mm.

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